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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,927	07/20/2001	Kenneth Perlin	NYU-7	2411

7590 11/15/2005

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EXAMINER	
NGUYEN, KEVIN M	
ART UNIT	**PAPER NUMBER**
2674	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,927	PERLIN ET AL.	
	Examiner	Art Unit	
	Kevin M. Nguyen	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is made in response to applicant's argument filed on 08/22/2005. Claims 1-11 are previously presented and original. Thus, claims 1-11 are currently pending in the application. Applicant's arguments, see pages 8 and 9, filed 08/22/2005, with respect to the rejection(s)of claim(s) 1-11 under the statutory basis for the previous rejection have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art references.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamagishi (US 6,049,424) in view of Wiseman et al (US 5,825,337) hereinafter Wiseman.

3. As to claims 1 and 7, Hamagishi teaches 3D display device associated with a method, the 3D display device comprising:

a display screen upon which stripes of the image appear in at least three distinct phases [3D images, col. 12, line 53, are displayed on the LCD screen 20, fig. 11, col. 12, lines 33-34, three images composes strips of three red, green, and blue columns of pixels, see fig. 11, col. 12, lines 40-42];

it is noted that a first embodiment, fig. 10, and a second embodiment, fig. 18, and a third embodiment, figs. 20, 21, and 25, are equivalent;

a light blocking shutter (a light shutter 40, fig. 18, a shading barrier 10, fig. 10) disposed in front of the display screen (a display screen 20, figs. 10 and 18) forming a stripe pattern during each of the at least three distinct phases [each of the first and second data output periods α and β is composed of three images composes strips of three red, green, and blue columns of pixels, see fig. 11, col. 12, lines 40-42];

a computer (a shading barrier control circuit unit 115, fig. 10) connected to the display screen (a LCD panel 20, fig. 10) and the light blocking shutter (a shading barrier 10, fig. 10) which changes the phases so in each the strip pattern is shifted laterally (see fig. 17) [the shading barrier control circuit unit 115, see fig. 10, carries out such control that the liquid crystal shutter 31, see fig. 18, is turned off and the liquid crystal shutter 32, see fig. 18, is turned on, col. 12, lines 27-30], which renders 2 3D scenes corresponding to the eyes of the observer for arbitrary observer position and orientation, which produces a proper left/right orientation pattern for each of the three phases and which interleaves the left/right orientations into three successive time phases as red, green and blue, respectively [when the viewer 2 is in the normal view position, therefore light from the pixels in even column which are first pixels, that is, the pixels for left eyes images L is incident on the left eye 2L of the viewer 2, and light from the pixels in odd columns which are second pixels, that is, the pixels for right eye image R is incident on the right eye 2R of the viewer 2. Therefore, the viewer 2 can view good 3D images in the normal viewing state, see col. 12, lines 47-54. Each of the first and second data

output periods α and β is composed of three images composes strips of three red, green, and blue columns of pixels, see fig. 11, col. 12, lines 40-42]; and continually changes the width and positions of the strips as the observer moves [the third embodiment is for enlarging the range in which 3D image can be viewed with respect to forward or backward movement and leftward or rightward movement of a viewer, see figs. 20 and 21, col. 16, lines 9-12];

and an eye tracker (a sensor 101, see fig. 25) for identifying the locations of the observers' eyes and providing the location to the computer [the right eye 2R and the left eye 2L of a viewer 2, col. 7, lines 46-47, are tracking and outputting the sensitive signals from the sensor 101 for sensing the position of the viewer 2 is fed to the position sensing control circuit unit 102 that senses whether the head of the viewer 2 is in a normal view position or a reversed view position by the output of the sensor 101, see figs. 10 and 25, col. 10, lines 18-23].

Accordingly, Hamagishi teaches all of the claimed limitations except for "only 1/3 of each stripe of the image on the display screen during each of at least three distinct phases as red, green and blue."

However, Wiseman teaches 3D display device (see the title) including 1/3 of each stripe of the image on the display screen during each of at least three distinct phase as red, green and blue [each of these regions 13 can be switched between one of a number of colors red, green, and blue, see col. 5, lines 24-26; Light from the image source 5 passes through an image lens 5 and an aperture 7 in a shutter 8. The shutter 8 comprises an array of independently activated the apertures 7, see fig. 2, col. 4, lines

27-31]. Thus, the light passes only one (1) of the number of colors red, green, and blue (3) or 1/3 of each stripe of each of at least three distinct phases as red, green and blue as claimed.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to implement Wiseman's the light passes only one (1) of the number of colors red, green, and blue (3) corresponding to 1/3 of each stripe of each of at least three distinct phases as red, green and blue in Hamagishi's 3D display device in order to achieve the benefit of provide a viewer with collimated light to improve the autostereoscopic effect of the display (see Wiseman, col. 3, lines 34-36).

4. Claims 2-5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamagishi in view of Wiseman as applied to claims 1 and 7 above, and further in view of Sullivan (US 6,377,229).

The combination of Hamagishi and Wiseman teach all of the claimed limitations, except wherein the display screen includes a rear projection, the computer includes a field programmable gate array to perform encoding into three bit-maps, and the ferroelectric liquid crystal.

As to claim 2, Sullivan teaches an apparatus has described in claim 1 wherein the display screen includes a rear projection screen [a rear projection screen 20, see fig. 1].

As to claim 3, Sullivan teaches an apparatus as described in claim 2 wherein the display screen includes a field programmable gate array in communication with the projection screen and the shutter which synchronizes the phases between the shutter

and the projection screen [the graphics data source 16 may optically be a graphics application program of a computer which operates an application program interface and a device driver for providing the 3D image data in an appropriate format to the a multi-planar volumetric display (MVD) controller 18 of the computer through an input/output device such as an interface 14, see col. 5, lines 29-34].

As to claim 4, Sullivan teaches an apparatus as described in claim 3 wherein the display screen [the liquid crystal display 36-42, col. 6, lines 49-50] includes a digital light processor projector [the MVD controller 18, fig. 1] in communication with the array and the projection screen [the liquid crystal display 36-42] which displays the three phases of images sequentially and controls the timing of the phases [the MVD controller 18 synchronizes the switching of the optical element 36-42 (LCD), col. 10, lines 33-34, has enough time during the delay to generate the respective images 82-88 from the sets of frame data 1-4 respectively, see col. 10, lines 44-46].

As to claim 5, Sullivan teaches an apparatus as described in claim 4 wherein the display screen includes a ferroelectric liquid crystal in communication with the array, the light processor, and the projection screen which shutters the start and stop of each phase [referring to Figs. 12-14, the orientations of the principle axes of the half waveplate formed by the pixels 126 of the ferroelectric liquid crystal (FLC) 124 are shown at 0V, 2.5V, and 5V, respectively, to have a 0°, a 45°, and a 90° polarization, respectively, see col. 14, lines 48-51].

As to claims 8 and 9, Sullivan teaches a method as described in claim 7 wherein the forming step includes the step of encoding into 3 1-dimensional bit-maps the three

phases of stripe for the light shutter, each indicating an on-off pattern for shutter micro-stripes at one of the three phases; and sending these bit-maps to a field programmable gate array of the display screen [the graphics data source 16 and the MVD controller 18 may also perform zero-run encoding through the interface 14 in order to maximize the rate of transfer image data to the MVD controller 18 for image generation the file format such as the Motion Picture Experts Group (MPEG) data or the bit-maps, see col. 6, lines 4-10]. Thus, the MPEG corresponds to the 1-dimensional bit-maps and the bit patterns as claimed. Therefore, the combination of Hamagishi, Wiseman, and Sullivan teach three 1-dimensional bit-maps/three bit-patterns the three phases of strip of the light shutter as claimed.

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to implement the rear projection, the computer performs the encoder the bit-maps, and the ferroelectric liquid crystal as taught by Sullivan in the combination of Hamagishi and Wiseman in order to achieve the benefit of the anti-aliasing adjusts the display of voxels in the transition between optical, and generate a smooth transition between portions of the volumetric three-dimensional image (see Sullivan, col. 3, lines 52-57).

5. Claims 6, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view Hamagishi in view of Wiseman in view of Sullivan as applied to claims 1 and 7 above, and further in view of Johnson et al (US 5,231,521) hereinafter Johnson.

The combination of Hamagishi and Wiseman and Sullivan teach all of the claimed limitations except for the shutter comprising the pi-cell.

However, Johnson teaches the liquid crystal display (LCD)/shutter including the pi-cells ($\Gamma_1, \Gamma_2, \ldots \Gamma_n$), see fig. 2, which orient such that the optic axes of the elements form angles ($\Theta_1, \Theta_2, \ldots \Theta_n$) with respect to the input polarization, see fig. 1, col. 9, lines 44-47 .

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the pi-cells which orient such that the optic axes of the elements form angles with respect to the input polarization as taught by Johnson in the combination of Hamagishi and Wiseman and Sullivan's LCD in order to achieve the benefit of be optimized for increased spectral discrimination, improved single and multiple stage filters, discretely tunable and continuously tunable filters (see Johnson, col. 4, line 65).

Response to Arguments

6. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Nguyen whose telephone number is 571-272-7697. The examiner can normally be reached on MON-THU from 8:00-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick N. Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the Patent Application Information Retrieval system, see http://portal.uspto.gov/external/portal/pair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin M. Nguyen
Patent Examiner
Art Unit 2674

KMN
November 11, 2005

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SUPERVISORY PATENT EXAMINER